



High Speed Cameras in Performance and Injury

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Aims of Today

- Introduce the Louth Hub
- Highlight common issues with high speed camera use
- Demonstrate how high speed cameras can be used in performance
- Identify injury prevention and the relationship with performance



The Louth Hub

- Two high speed IDT cameras (up to 18,000 fps)
- GoPro cameras (2 x Hero II, 1 x Hero4)
- Sense 3D Scanner
- Adidas MiCoach Smartball
- Neptune Bone Conduction MP3
- And much more...
- Biomechanical consultancy



Sports Biomechanics

“Concerned with the analysis of the mechanics of human movement...

...In other words, the science of explaining how and why the human body moves in the way that it does.”

www.BASES.org.uk

High Speed Camera Considerations

- Camera placement (90°)

- Frame rate



300Hz



600Hz



1200Hz

- Shutter speed

- Trigger setting (pre- / post-)

High Speed Camera Considerations





Improving Performance



Small Bore Rifle Performance



- Prone shooting position
- Controlled, with limited movement
- Reloading causes an issue
- Elbow placement



Small Bore Rifle Performance



Rifle Phase Breakdown



1. Trigger Pull



2. Cartridge Pick Up



3. Reload



4. Take Aim

Rifle Elbow Placement



4. Take Aim

Rugby Place Kicking



Good



Bad foot strike

Ball Release



Good



Bad foot strike

Torso Lean



Good



Bad foot strike

Ball Contact



Good



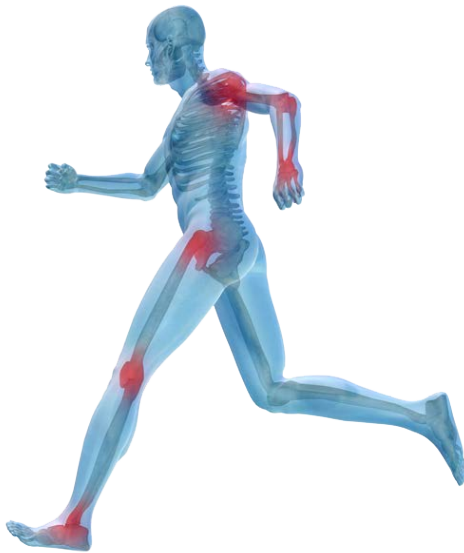
Bad foot strike

GoPro Footage





Injury Prevention



Netball ACL Injury Occurrence



- Connects femur (thigh) to tibia (shin)
- Females 3 x more likely to rupture ACL
- 16.5% of female Netball injuries ACL (5 year period)
- 6-12 months return to sport... some more



Netball Jump Landing Tasks



Forward Jump Tasks



Single Leg Hop Tasks



Rotational Jump Tasks

Knee Flexion

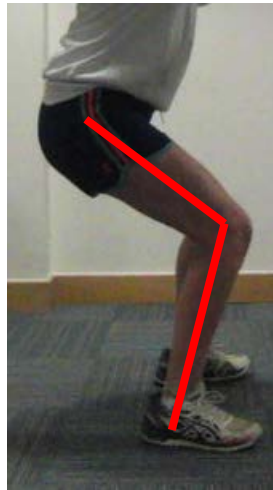
Prior Knee Flexion



Loading Knee Flexion



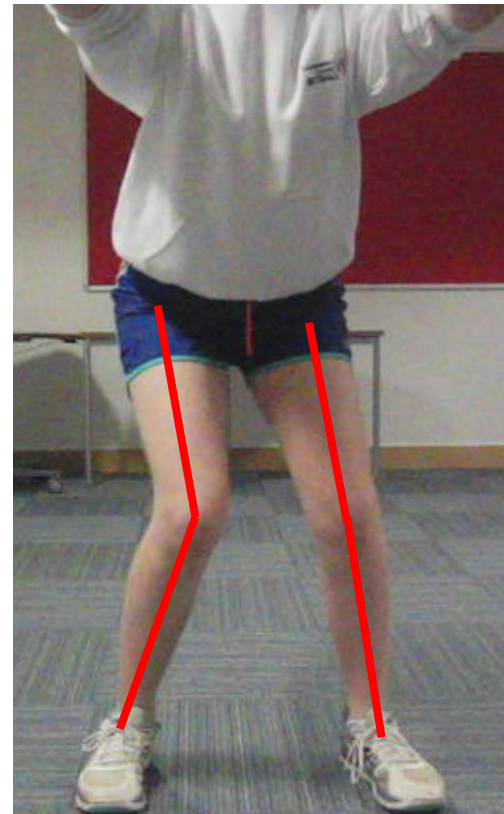
Single Leg Foot Flexion



Rate of Loading



Knee Valgus



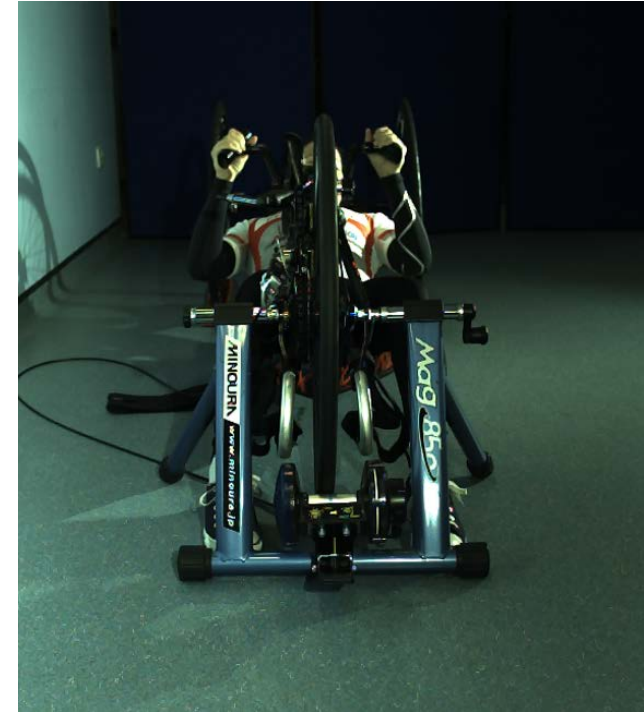
Performance and Injury Balance



Performance and Injury Balance



Liz McTernan: Hand-bike Analysis



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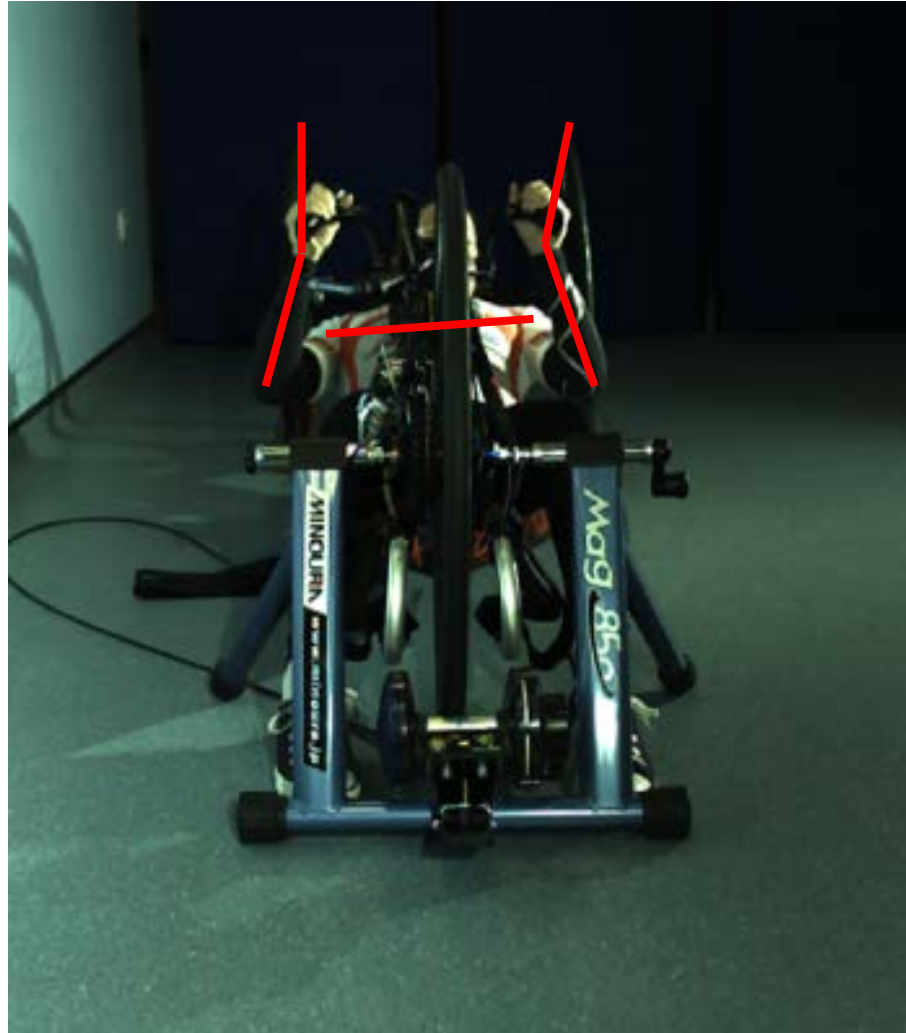


Seat position

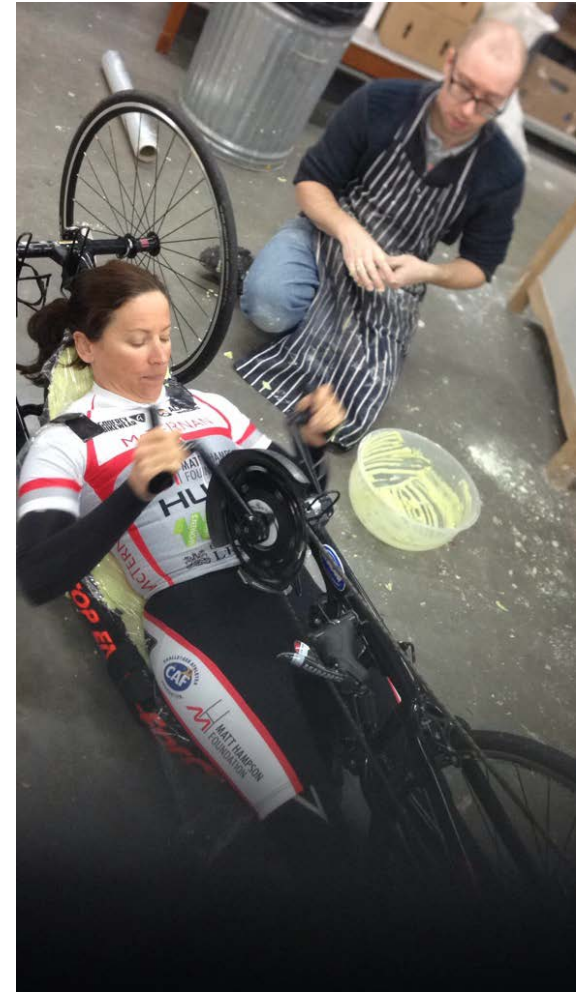
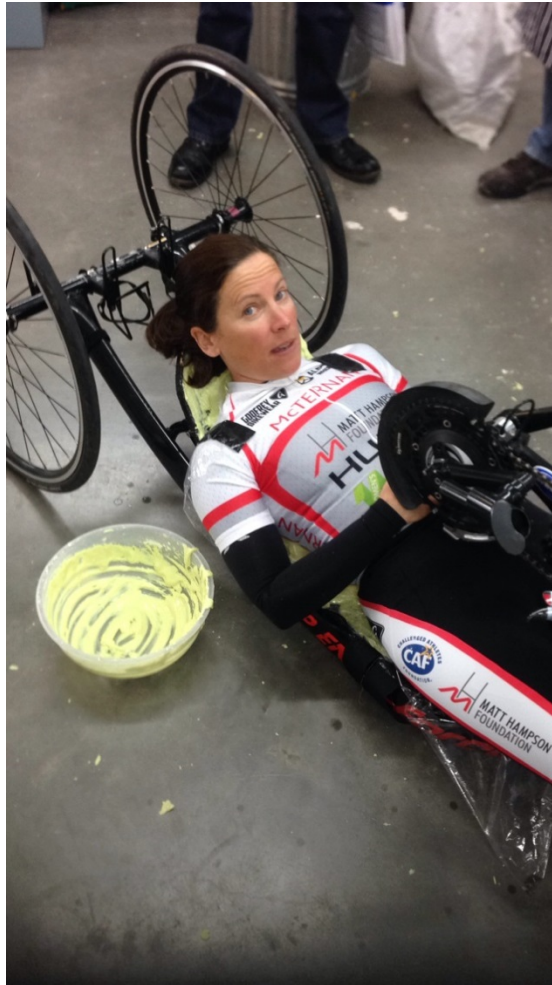
Lumber Support

Shoulder movement

Liz McTernan: Hand-bike Analysis



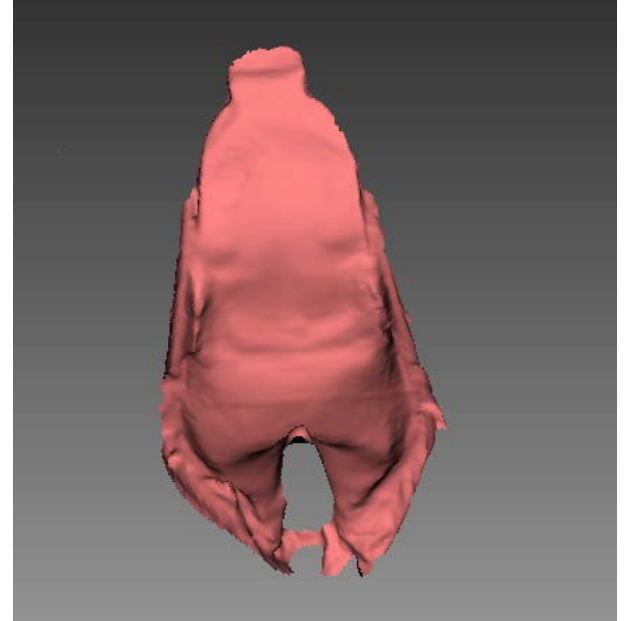
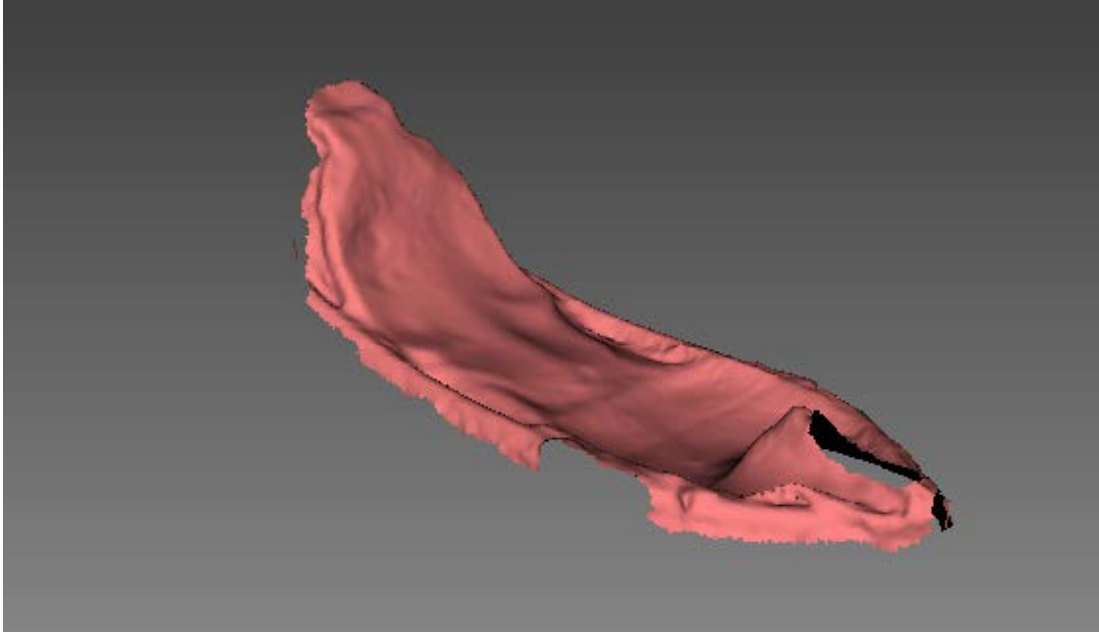
Making a Mould



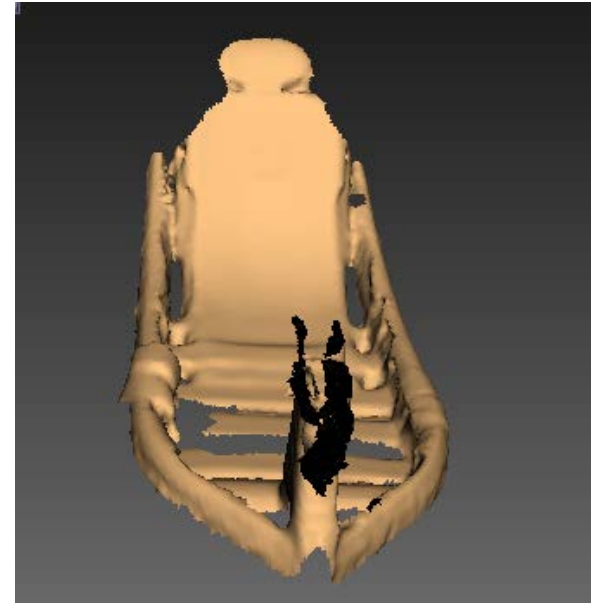
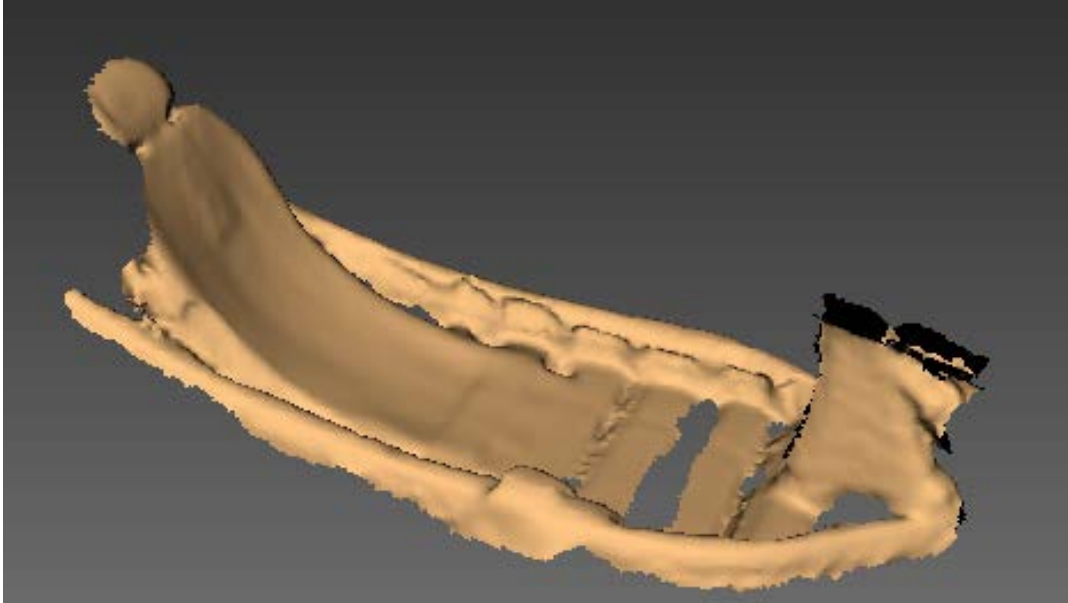
Recreating Liz



Mould Scan



Seat Scan



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